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Engineering *Lactococcus lactis* into a cell factory for production of butanol isomers

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Butanol isomers are considered good fuel alternatives as well as valuable chemical building blocks, due to their high energy density, low hygroscopicity and comparable high reactivity. In this project, we explore the possibilities for biosynthesis of butanol isomers in *Lactococcus lactis* using metabolic engineering for expression of relevant heterologous pathways. The work is built upon a selection of *L. lactis* strains optimized for product formation through the pyruvate note, which has previously been used for achieving efficient production of a variety of bio-chemicals.

For a strain to be a proper candidate for second generation bio-refineries it should be highly efficient, robust with respect to withstanding high titers of products and inhibitors released during biomass pretreatment, and preferably be able to utilize both pentoses and hexoses simultaneously. Lactic acid bacteria have previously been identified as good candidates in general for bioconversion of lignocellulosic materials and show great tolerance to butanol and other alcohols. In this project, we focus on adapting and engineering *L. lactis* for solving these challenges.